

state number, at least one of said one or more populations of multiply charged ions comprising a plurality of sub-populations of ions formed from one of said one or more distinct polyatomic parent molecular species in said sample, all the ions of each of said sub-populations having the same charge state number, said same charge state number differing from the charge state numbers of the ions in the other sub-populations of said plurality of sub-populations, said plurality of sub-populations comprising one sub-population for each value of charge state number beginning with a smallest value not less than three and extending to a largest value not less than five.

Claim 68 (amended), lines 1-3: "said plurality of sub-populations.....not less than seven." change to --said smallest value of charge state number is not less than five and said largest value is not less than seven--

Claim 69 (amended), lines 1-4, "said plurality of sub-populations..... not less than 10" change to --said smallest value of charge state number is not less than seven and said largest value is not less than ten--

Claim 72 (amended), line 3 "elements" change to --elemental species--

lines 3-4 "polyethylene glycols" change to --poly (ethylene glycol)s--

Claim 73 (amended), lines 1-5, "in which....parent molecular species" change to --such that a mass analysis of said multiply charged ions in said at least one population of multiply charged ions comprising a plurality of sub-populations, produces a set of

values for the mass/charge ratios of the multiply charged ions in said at least one population of ions, said set of values of mass/charge ratio providing a basis for calculating a value of molecular weight for the said at least one polyatomic parent molecular species from which said at least one population of multiply charged ions was formed.

Claim 75 (amended), lines 5-8: "charge number which differs..... said populations having said charge state number" change to --charge state number, said charge state number differing by one from the next largest and the next smallest values of charge state number found in the other sub-populations of said plurality, each of said sub-populations having a value of said charge state number that is--

Claim 79 (amended), lines 4-6: "analyzation of said peaks of said mass spectrum" change to --analysis of the mass/charge values of the ions giving rise to each of said peaks in said sequence of peaks of said mass spectrum--

Claim 82 (amended), lines 5-7, "and for each of said populations.....not less than five." --of ions, each of said plurality of sub-populations being comprised of ions formed from one of said distinct polyatomic parent molecular species and having the same charge state number, there being at least one of said populations of ions that comprises one of said sub-populations for each value of charge state number beginning with a smallest value of three and extending to a largest value not less than five.

Claim 83 (amended), lines 1-4 "said plurality of sub-populations..... not less than seven." change to --said smallest value

of charge state number is not less than five and said largest value of charge state number is not less than seven.--

Claim 84 (amended), lines 1-4 "said plurality of sub-populations.....not less than seven" change to --said smallest value of charge state number is not less than seven and said largest value of charge state number is not less than ten.--

Claim 88 (amended), lines 3-4 "elements, said group comprising polyethylene glycols." change to --elemental species, said group comprising poly (ethylene glycol)s--.

Claim 89 (amended), line 3, delete "amu"

Claim 90 (amended), line 4, "a plurality of sub-populations-.....maximum value not less than five." change to --ions formed from one of said distinct polyatomic parent molecular species, at least one of said populations of ions being comprised of a plurality of sub-populations, the ions of each of said sub-populations having the same charge state number, there being one of said sub-populations for each value of said charge state number beginning with a smallest value of three and extending to a largest value not less than five.--

Claim 91 (amended), line 1-2, "each of said.....not less than seven." change to --the value of charge state number for all the ions in at least one of said populations is not less than seven.

Claim 94 (amended), line 3-4, "elements, said group comprising polyethylene glycols." change to --elemental species, said group comprising poly (ethylene glycol)s--.

Claim 95 (amended), line 3, delete "amu".

Claim 96 (amended), line 3, delete "amu".

Claim 97 (amended), lines 4-7, "a plurality of.....maximum value not less than five." change to --ions formed from one of said distinct polyatomic parent molecular species in said sample, at least one of said populations of ions being comprised of a plurality of sub-populations, the ions of each of said sub-populations having the same value of charge state number, that value being different from the values of charge state number in all the other sub-populations of ions in said at least one of said populations, all the ions in said plurality of sub-populations having a smallest value of charge state number not less than three--

Claim 98 (amended), lines 1-4, "each of said sub-populations.....value is not less than seven" change to --said smallest value of charge state number is not less than five.

Claim 99 (amended), lines 1-4 "each of said sub-populations.....is not less than ten" change to --said smallest value of charge state number is not less than seven.

Claim 102 (amended), line 2, "indistinct" change to --indistinguishable--

Claim 104 (amended), lines 3-4 "elements.....polyethylene glycols" change to --elemental species, said group comprising poly (ethylene glycol)s

Claim 109 (amended), lines 4-14 "a plurality of sub-populations..... values of said ions in said sub-populations" change to --ions formed from said one or more distinct polyatomic parent molecular species, at least one of said populations of ions comprising a plurality of sub-populations of ions, all the ions in each

sub-population having the same charge state number, said population comprising one such sub-population for each possible value of charge state number beginning with a smallest value not less than three and extending to a largest value not less than five, said composition of matter being useful in the determination of a value of molecular weight for one or more of said distinct polyatomic parent molecular species, said determination of molecular weight being achieved by means of a mass analysis of the ions in said one or more populations of ions and a calculation of the molecular weight values of said polyatomic parent molecular species from the values of mass/charge ( $m/z$ ) obtained for the ions in said one or more populations of ions by said mass analysis--

Claim 110 (amended), lines 1-4, "each of said populations is comprised..... not less than seven" change to --said smallest value of charge state number is not less than five and said largest value of charge state number is not less than seven--

Claim 111 (amended), lines 1-4, "each of said populations.. ..not less.. than ten" change to --said smallest value of charge state number is not less than seven and said largest value of charge state number is not less than ten--

Claim 112 (amended), lines 1-3, "said" change to---any particular one of said--

line 3, "weight" change to --weight and chemical identity--

Claim 115 (amended), lines 3-4, "elements,.....polyethylene glycols" change to --elemental species, said group comprising poly (ethylene glycol)s--

Claim 116 (amended), line 3, delete "amu"

Claim 117 (amended), lines 4-14 "a plurality of sub-populations..... (m/z) values of said ions in said sub-populations" change to --ions formed from one of said one or more distinct polyatomic parent molecular species, at least one of said populations of ions comprising a plurality of sub-populations of ions, all the ions in each sub-population having the same charge state number, said charge state number differing from the charge state number of the ions in the other sub-populations of said population, said charge state number having a value of at least five for all the ions in at least one of said populations of ions, said composition of matter being useful for determination of a value of molecular weight for one or more of said distinct polyatomic parent molecular species, said determination of molecular weight being achieved by a mass analysis of the ions in said one or more populations of ions together with a calculation of the said molecular weight of said one or more polyatomic parent molecular species from the values of mass/charge (m/z) of said ions in said one or more populations of ions obtained by said mass analysis--

Claim 118 (amended), lines 1-2, "each of said sub-populations has said charge state number not less than seven" change to --every ion in said least one of said populations has a value of charge state number not less than seven.

Claim 121 (amended), line 3, "polyethylene glycols" change to --poly (ethylene glycol)s--

Claim 122 (amended), line 3, delete "amu".

Claim 123 (amended), lines 4-7, "populations comprising a

plurality of sub-populations.....and analyzed by: " change to --distinct populations of multiply charged ions, each of said multiply charged ions in any one of said distinct populations having been formed from one of said distinct polyatomic parent molecular species in said sample, at least one of said distinct populations of multiply charged ions comprising a plurality of sub-populations of ions, all the ions in each sub-population of said plurality of sub-populations having the same charge state number, said same charge state number differing from the charge state numbers of the ions in the other sub-populations of said plurality of sub-populations, said plurality of sub-populations comprising one such sub-population for each possible value of charge state number beginning with a smallest value not less than three and extending to a largest value not less than five, said composition of matter being formed by:--

line 15, "ions;" change to --ions.--

lines 16-23, delete "passing said multiply charged ions in said bath gas.....molecular species from the mass/charge (m/z) values of said ions in said sub-populations."

Claim 124 (amended), lines 1-4, "each of said populations.....less than seven" change to --said smallest value of charge state number is not less than five and said largest value is not less than seven--

Claim 125 (amended), lines 1-4, "said plurality.....less than ten" change to --said smallest value of charge state number is not less than seven and said largest value is not less than ten--

Claim 126 (amended), lines 1-2, "said" change to --any particular one of said--

Claim 129 (amended), lines 3-4, "elements, said group comprising poly-ethylene glycols" change to "elemental species, said group comprising poly (ethylene glycol)s.

Claim 132 (amended), lines 3-4, "bath gas is directed in a substantially counter current direction" change to --bath gas flows in a direction substantially counter current to said first direction--

Claim 134 (amended), line 1, "comprising" change to --that by mass analysis of its component ions is found to comprise--

line 4, "polyethylene glycols" change to --poly (ethylene glycol)s

lines 5-7, "populations comprising a plurality of.....being performed by" change to --distinct populations of multiply charged ions comprising ions, each of said multiply charged ions having been formed from one of said distinct poly-atomic parent molecular species, at least one of said distinct populations of multiply charged ions comprising a plurality of sub-populations of ions, all the ions in each sub-population having the same charge state number, said charge state number differing from the charge state number of the other sub-populations in said plurality of sub-populations, said plurality of sub-populations comprising one such sub-population for each possible value of charge state number beginning with a smallest value not less than three and extending to a largest value not less than five, said composition of matter being formed by--



lines 16-23, "passing said multiply charged ions.....from the mass/charge (m/z) values of said ions in said sub-populations" change to --said mass analysis being carried out on a portion of said multiply charged ions in said bath gas that is introduced into a vacuum system containing a mass analyzer--,

Claim 135 (amended), lines 1-4, "each of said populations.....less than seven" change to --said smallest value of charge state number is not less than five and said largest value is not less than seven--

Claim 136 (amended), lines 1-4. "each of said populations.....less than five" change to --said smallest value of charge state number is not less than seven and said largest value is not less than ten--

Claim 137 (amended), line 1, "said" change to --any particular one of said--

Claim 139 (amended), line 3, delete "amu"

Claim 140 (amended), line 3, "molecular weight" change to --molecular weight and chemical identity--

lines 4-10, "a population of multiply charged ions.....sequence of each distinct" change to --one or more distinct populations of ions, at least one of said distinct populations of ions comprising multiply charged ions formed from one of said one or more distinct polyatomic parent molecular species in said sample, the number of charges on each ion defining the charge state number of that ion, each of said populations of multiply charged ions having the property that when its ions are mass analyzed they give rise to a mass spectrum comprising a multiplicity

of peaks, said multiplicity of peaks comprising at least one coherent sequence of peaks, the ions of each peak in said coherent sequence having the same charge state number, said charge state number being greater than unity and differing by one unit from the charge state numbers of the ions of each immediately adjacent peak in said coherent sequence, said coherent sequence of peaks comprising one peak for each different value of charge state number beginning with a smallest value not less than three and extending to a largest value not less than five--

Claim 141 (amended), lines 1-2, "at least one.....not less than seven" change to --said smallest value of charge state number is not less than five and said largest value of charge state number is not less than seven--

Claim 143 (amended), line 3, "polyethylene glycols" change to --poly (ethylene glycol)s--

Claim 146 (amended), line 10, "average mass" change to --effective average mass (which can sometimes be negative in the case of negatively charged ions)--

lines 13-15, "said plurality of sub-populations... ..is not less than five" change to --said distinct populations of ions including at least one population in which all the ions have values of  $i$  greater than two--

Claim 147 (amended), lines 1-3, "plurality of sub-populations.. ..not less than seven" change to --distinct populations of ions includes at least one population in which all the ions have values of  $i$  greater than four--

Claim 148 (amended), lines 1-3, "plurality of sub-populations..

....not less than 10" change to --distinct populations of ions includes at least one population in which all the ions have values of  $i$  greater than six--

Claim 151 (amended), line 3, "polyethylene glycols" change to --poly (ethylene glycol)s--

Claim 152 (amended), lines 1-6, "characterized by,.....said distinct polyatomic parent molecular species." change to --for which the mass spectrum of the said distinct populations of ions formed from at least one of said distinct parent polyatomic molecular species comprises a coherent sequence of peaks, the ions of each peak differing from the ions of each adjacent peak by one adduct charge, the set of mass/charge ( $m/z$ ) values resulting from the mass analysis of the ions giving rise to said coherent sequence of peaks in said mass spectrum, leading by appropriate calculations to a value for the molecular weight ( $M_r$ ) of said distinct parent polyatomic molecular species--

Claim 155 (amended), lines 9-10, "average mass" change to --effective average mass (which can be negative for some negatively charged ions)--

Claim 158 (amended), lines 1-7, "characterized in that.....  
....distinct polyatomic parent molecular species" change to --such that the mass spectrum of the ions formed from at least one of said distinct populations of multiply charged ions comprises a sequence of peaks, one peak for each value of  $x_i$  found by mass analysis of the ions of said distinct population of multiply charged ions, the set of values for  $x_i$  including one for each value of  $i$  beginning with a smallest value of 4 and extending to a largest value not

less than seven--

Claim 161 (amended), lines 9-10, "average mass" change to --effective average mass (which can be negative for some negatively charged ions)--

lines 13-15, "said plurality of sub-populations...  
.....whose maximum is not less than five" change to --the value of  $i$  being at least three for every ion in at least one of said distinct populations of ions--

Claim 162 (amended), lines 1-4, "at least one of said.....  
...not less than seven" change to --every ion in at least one of said distinct populations of ions has a value of  $i$  that is not less than five--

Claim 163 (amended), lines 1-3, "at least one of said.....not less than ten" change to --every ion in at least one of said distinct populations of ions has a value of  $i$  that is not less than seven--

Claim 165 (amended), line 3, "polyethylene glycols" change to --poly (ethylene glycol)s--

Claim 166 (amended), line 3, delete "amu"

Please cancel Claims 167-187, without prejudice, and enter the following new claims 188-199.

Claim 188. A composition of matter comprising one or more populations of polyatomic gaseous ions, at least one of said populations of ions comprising multiply charged ions formed from the same chemically distinct parent species of polyatomic neutral molecules, said same chemically distinct species of polyatomic

neutral molecules not including synthetic polymers such as poly (ethylene glycol)s, all of said multiply charged ions, formed from said same chemically distinct species of polyatomic neutral molecules, having at least three charges.

Claim 189. A composition of matter according to Claim 188 in which all of said multiply charged ions, formed from said same chemically distinct species of polyatomic neutral molecules, have at least five charges.

Claim 190. A composition of matter according to Claim 188 in which all of said multiply charged ions, formed from said same chemically distinct species of polyatomic neutral molecules, have at least seven charges.

Claim 191. A composition of matter comprising one or more populations of polyatomic gaseous ions, at least one of said populations of polyatomic ions comprising multiply charged ions formed from the same chemically distinct parent species of polyatomic neutral molecules, said chemically distinct parent species of polyatomic molecules not being selected from the class comprising oligomers of synthetic polymers such as poly (ethylene glycol)s, the number of charges on each ion defining the charge state number of that ion, said at least one of said populations of polyatomic multiply charged ions comprising a plurality of sub-populations, one such sub-population for each value of charge state number beginning with a smallest value not less than three and extending to a largest value not less than five.

Claim 192. A composition of matter according to Claim 191 in which said smallest value of charge state number is not less than

five and said largest value is not less than seven.

Claim 193. A composition of matter according to Claim 191 in which said smallest value of charge state number is not less than seven and said largest value is not less than ten.

Claim 194. A composition of matter comprising one or more populations of gaseous ions, at least one of said populations comprising multiply charged ions having a net charge equal to or greater than three elementary charges and a composition characterized by the empirical chemical formula (Cc Hh Nn Oo Ss Pp Tt Uu Vv Ww Yy) wherein upper case letters C,H,N,O,S,P stand respectively for the elements Carbon, Hydrogen, Nitrogen, Oxygen, Sulfur, Phosphorous and T, U, V, W, Y each stand for other elements in the Periodic Table, the lower case subscript letters associated with each of said upper case letters symbolizing an integer indicating the number of atoms of the corresponding element in said ion, all the ions with three or more charges in at least one of said one or more populations of ions having compositions such that the number of different subscripts c,h,o,n,p,s,t,u,v,w having values greater than zero is five or less, said ions not being derived from a member of the class of synthetic polymers that includes poly (ethylene glycol)s.

Claim 195. A composition of matter as in Claim 194 in which all the ions in said at least one population of multiply charged ions have at least five charges.

Claim 196. A composition of matter as in Claim 194 in which all the ions in said at least one population of multiply charged ions have at least seven charges.

Claim 197. A composition of matter comprising one or more populations of gaseous ions, at least one of said populations comprising multiply charged ions having a net charge equal to or greater than three elementary charges and a composition characterized by the empirical chemical formula (Cc Hh Nn Oo Ss Pp Tt Uu Vv Ww Yy) wherein upper case letters C,H,N,O,S,P stand respectively for the elements Carbon, Hydrogen, Nitrogen, Oxygen, Sulfur, Phosphorous and T, U, V, W, Y each stand for other elements in the Periodic Table, the lower case letters symbolizing an integer indicating the number of atoms of the corresponding element in said ion, all the ions with three or more charges in at least one of said one or more populations of ions having compositions such that the number of different subscripts c, h, n, o, p, s, t, u, v, w having values greater than zero is greater than five.

Claim 198. A composition of matter as in Claim 197 in which all the ions in said at least one population of multiply charged ions have at least five charges and a composition such that the number of different subscripts c, h, n, o, p, s, t, u, v, w having values greater than zero is greater than five

Claim 199. A composition of matter as in Claim 197 in which all the ions in said at least one population of multiply charged ions have at least seven charges and a composition such that the number of different subscripts c, h, n, o, p, s, t, u, v, w having values greater than zero is greater than five.